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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

MCCARTNEY, LINZY T

ART UNIT

PAPER NUMBER

2671

DATE MAILED: 12/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/823,441

Applicant(s)

NOUGARET ET AL.

Examiner

Linzy McCartney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION***Claim Rejections - 35 USC § 103***

1. Claims 1-3, 5, 7-9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brogan et al., “*Group Behaviors for Systems with Significant Dynamics*”

a. Referring to claim 1, Brogan discloses a method of producing an animation of a group including a plurality of members (Abstract and Fig. 10), said method comprising a continuous processing step for determining the states of the respective members at each time step in accordance with predetermined dynamic characteristics of the respective members (Fig. 9 shows a graphical representation of the continuous processing step and Equations 6-20 show the equations used to determine the state of the respective members at each time step in accordance with predetermined characteristics, i.e. torque, pitch, yaw, etc.); a discrete processing step for accepting a command specifying the overall state to be achieved for said group and assigning roles to the respective members of the group in accordance with the overall state specified by said command (As noted by the Applicant, the control factors are adjusted manually “...control factors are adjusted experimentally and manually...” – Applicant, page 5. These control factors are used to determine the position of members within the group “...a placement algorithm to determine the desired position for each individual...” – page 149, column 1, paragraph 1); wherein if new roles are assigned to members in said discrete processing step, the dynamic states of the respective members are adjusted in said continuous processing step, in accordance with the new assigned roles (Note Equations 8-14 and 20 are dependent upon position and as noted above the manual adjustment of the control factors adjusts the position, which in

turn adjust the dynamic states of the members of the groups as calculated by Equations 8-14 and 20). Brogan does not explicitly disclose that the discrete processing step accepts the commands from the outside. It would have been obvious at the time the invention was made to a person of ordinary skill in the art to input commands to a program from an input source outside the program (i.e. a keyboard, mouse, etc.). The suggestion/motivation for doing so would have been to provide a convenient method for a user to input data to a system.

b. Claim 2 is rejected per claim 1. Brogan discloses a method of producing an animation of a group including a plurality of members, according to Claim 1, wherein the said discrete processing step includes a role replacement step for replacing, among members, the roles currently assigned to the respective members (As noted in the rejection of claim 1 above, when the control factors are adjusted the positions of the members are adjusted accordingly) and wherein said role replacement step is performed when a predetermined triggering condition is satisfied or when it is determined that the overall performance index of the group can be reduced by the role replacement (“The effect of an obstacle on a creature’s behavior...an offset to the left or right of the obstacle is added...” – page 141, column 1, paragraph 2 and “...calculating the number of visible neighbors between creature and the obstacle and multiplying this number by an additional separation distance...” – page 141, column 1, paragraph 1. Note that the additional separation distance is a control factor that can be adjusted manually (“...(D_{off}) had to be doubled...” – page 147, column 2, paragraph 2).

- c. Claim 3 is rejected per claim 1. Brogan discloses a method producing an animation of a group including a plurality of members according to Claim 1, wherein said discrete processing step the roles of the respective members are determined so that the overall performance index of the group is minimized or reduced. As noted in the rejection of claim 2 above, the additional separation distance is used to calculate the offset distance necessary to avoid obstacles, which is one of the performance indices specified by Brogan (“We compare the performance of this algorithm... for a test suite of three problems... avoiding obstacles.”)
- d. Referring to claim 5, Brogan discloses a method of producing an animation of a group including a plurality of members, according to Claim 2, wherein said role replacement step, a plurality of members having the lowest performance indices are selected and roles are replaced among the plurality of selected members. Those members with the lowest individual performance indicia (i.e., those closest to the object) have their roles replaced (i.e. their positioned changed) to increase their distance from the object (“The effect of an obstacle on a creature’s behavior... an offset to the left or right of the obstacle is added...” – page 141, column 1, paragraph 2 and “...calculating the number of visible neighbors between creature and the obstacle and multiplying this number by an additional separation distance...” – page 141, column 1, paragraph 1).
- f. Claim 7 is rejected with the rationale of the rejection of claim 1. Claim 7 is merely claim 1 recited as an apparatus.
- g. Claim 8 is rejected with the rationale of the rejection of claim 1. Claim 8 is merely claim 1 recited as an apparatus.

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- h. Claim 9 is rejected with the rationale of the rejection of claim 1.
- i. Claim 11 is rejected with the rationale of the rejection of claim 1. Claim 11 is merely claim 1 recited as a program.
- 1. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brogan as applied to Claim 2 above in view of Blumberg, *"Go with the Flow: Synthetic Vision for Autonomous Animated Creatures"* (Blumberg).
 - a. Referring to claim 4, Brogan as applied to claim 2 above meets the limitations recited in claim 4 except "...wherein the overall performance index of the group is energy." Blumberg discloses a method in which motion energy from a visual field is used to perform obstacle avoidance in virtual characters (Abstract). When the aforementioned virtual character detects virtual motion energy in excess of a predetermined threshold the character turns ("...keep track of the total motion energy...when it is above some threshold...pick a direction to turn and turn." – page 539, paragraph 2). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the synthetic vision motion energy technique disclosed by Blumberg in the method of Brogan. The suggestion/motivation for doing so would have been because synthetic vision may be the simplest and fastest way to extract information from the environment, it scales better in complex environments and it makes the creature less dependent on the underlying representation/implementation of it's environment (Blumberg, page 538, paragraph 3).
- 2. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brogan as applied to claim 2 above in view of Microsoft, Age of Empires Help File (Microsoft).

- a. Referring to claim 6, Brogan as applied to claim 2 above meets the limitations recited in claim 6 except "...wherein said role replacement step further includes the step of inhibiting, in response to a command given from the outside, the processing associated with the role replacement for a predetermined period of time." Microsoft discloses a method for coordinated group movement ("To select a group drag the pointer over the villagers...you want to group...to move a villager...select a group...then right-click a location..." – pages 2 and 3) and the ability to pause the program, which would inhibit all processing including role replacement for a predetermined period of time chosen by the user (i.e. the updating of position of individual members of the group) ("...F3, PAUSE – Pause..." – page 10). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to incorporate the Pause function disclosed by Microsoft into the method of Brogan. The suggestion/motivation for doing so would have been to allow the user to halt processing.
3. Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brogan.
- a. Referring to claim 10, Brogan discloses a method of, in a simulation of a group including N members where N is an integer equal to or greater than 2 (Figure 1), controlling the movement of the members of the group so that members are moved from locations in a predetermined initial layout in a state space to locations in a target layout (Figure 8 gives a graphical representation of the aforementioned limitation. Note how the members of each group start out in a predetermined initial layout and as the members converge to steady state they form the target layout), assigning locations in said target layout to the respective members lying at locations in said initial layout so that the

members are moved along the shortest distances to the locations in the target layout.

(“...to compute a desired position...this position is a distance D away from the visible creature on the line between the two creatures...” – page 140, column 2, paragraphs 2-3 and Figs. 3, and 8. Brogan uses straight-line distances between neighboring members to determine position of members from an initial layout to a target layout), moving the members at the locations in said initial layout in accordance with the assignments made (Fig. 8), calculating the value of a predetermined evaluation function associated with the movements (“...the predicted error in position at the end of the next step is $e = x_{dp} - x_p$...” – page 143, column 2, paragraph 1) and selecting K members, where K is an integer equal to or smaller than N , having the greatest values of the evaluation function, replacing the assignments of the locations in the target layout with $K!$ combinations of the selected K members (Since all of N members of the group have their position altered according to the aforementioned predicted error, inherently the K members with the greatest values of the evaluation function have their locations in the target layout replaced) Brogan does not expressly disclose that after completion of step e), the method returns to step b) so as to perform steps b) to e) repeatedly. It would have been obvious at the time the invention was made to a person of ordinary skill in the art to perform steps b to e repeatedly. The suggestion/motivation for doing so would have been because repeatedly performing the aforementioned calculations would have been necessary to compute the positions of each member of the group at each iteration.

b. Claim 12 is rejected with the rationale of the rejection of claim 10. Claim 12 is merely claim 10 recited as a program.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Linzy McCartney** whose telephone number is **(703) 605-0745**.

The examiner can normally be reached on Mon-Friday (8:00AM-5:30PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Mark Zimmerman**, can be reached at **(703) 305-9798**.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:


(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

ltm

November 27, 2002


MARK ZIMMERMAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600